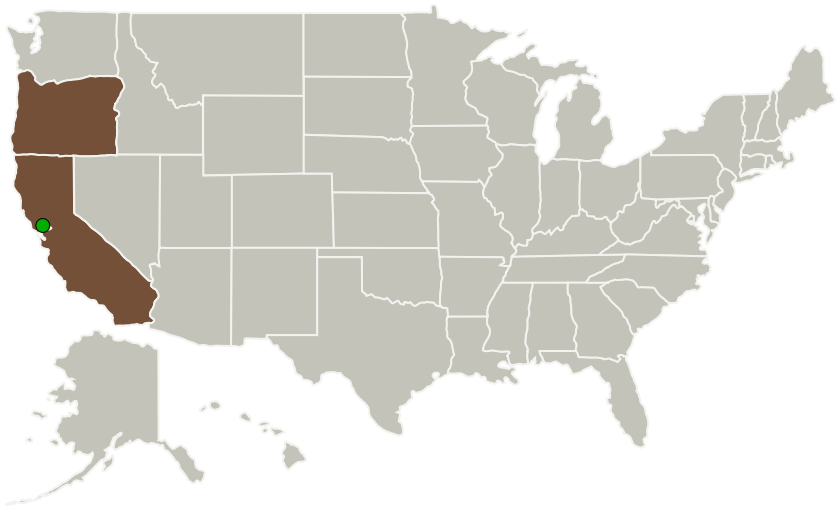
Brine Dewatering Using Ultrasonic Nebulization, Phase II

Completed Technology Project (2010 - 2012)

Project Introduction

Recovery of water from brine is critically important for future manned space exploration. Resupply of water is prohibitively costly for such extended missions. Water reclamation processes typically recover 90-95% of the water present in wastewater formed by combining urine, hygiene water, and humidity condensate with the remaining concentrated in brine. This concentrated brine contains a significant amount of water, potentially a very valuable resource. The proposed prototype development will recover virtually all of the remaining water using an ultrasonic brine dewatering system (UBDS). In the UBDS process, extremely small nebulized droplets of the brine are created ultrasonically at the brine↔air interface. Small droplets enable quicker drying due to their high relative surface area. This is particularly important when drying brines that contain thermally labile materials, which require relatively low temperature drying. The UBDS prototype has no nozzles to become plugged, requires little power, is simple and small, requires minimal astronaut attention and is compatible with continuous, closed cycle operation that can be made gravity independent. The innovative Phase 2 prototype will fulfill the unmet need to significantly improve water loop closure during extended manned missions. The Phase 2 project will provide an automated UBDS prototype that will be delivered to NASA for further testing.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
UMPQUA Research Company	Lead Organization	Industry	Myrtle Creek, Oregon
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Oregon

Project Transitions

January 2010: Project Start

April 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138849)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

UMPQUA Research Company

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

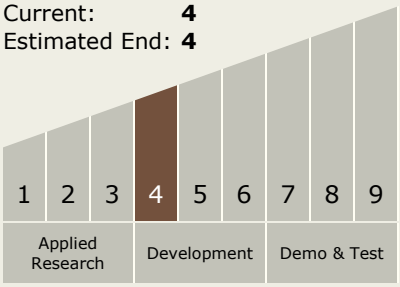
Carlos Torrez

Principal Investigator:

James R Akse

Technology Maturity (TRL)

Start: **4**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.3 Waste Management

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System